THE PATH FORWARD:

Flood Tunnel

presented by

Brian Gettinger, PE

FREESE AND NICHOLS


We have to get water to the Bay faster to prevent flooding
Houston needs more conveyance

Milam & Congress Street – Downtown Houston

5.5-16.5 inches of rainfall, heaviest west of Houston

Houston 1929 & 1935 Floods

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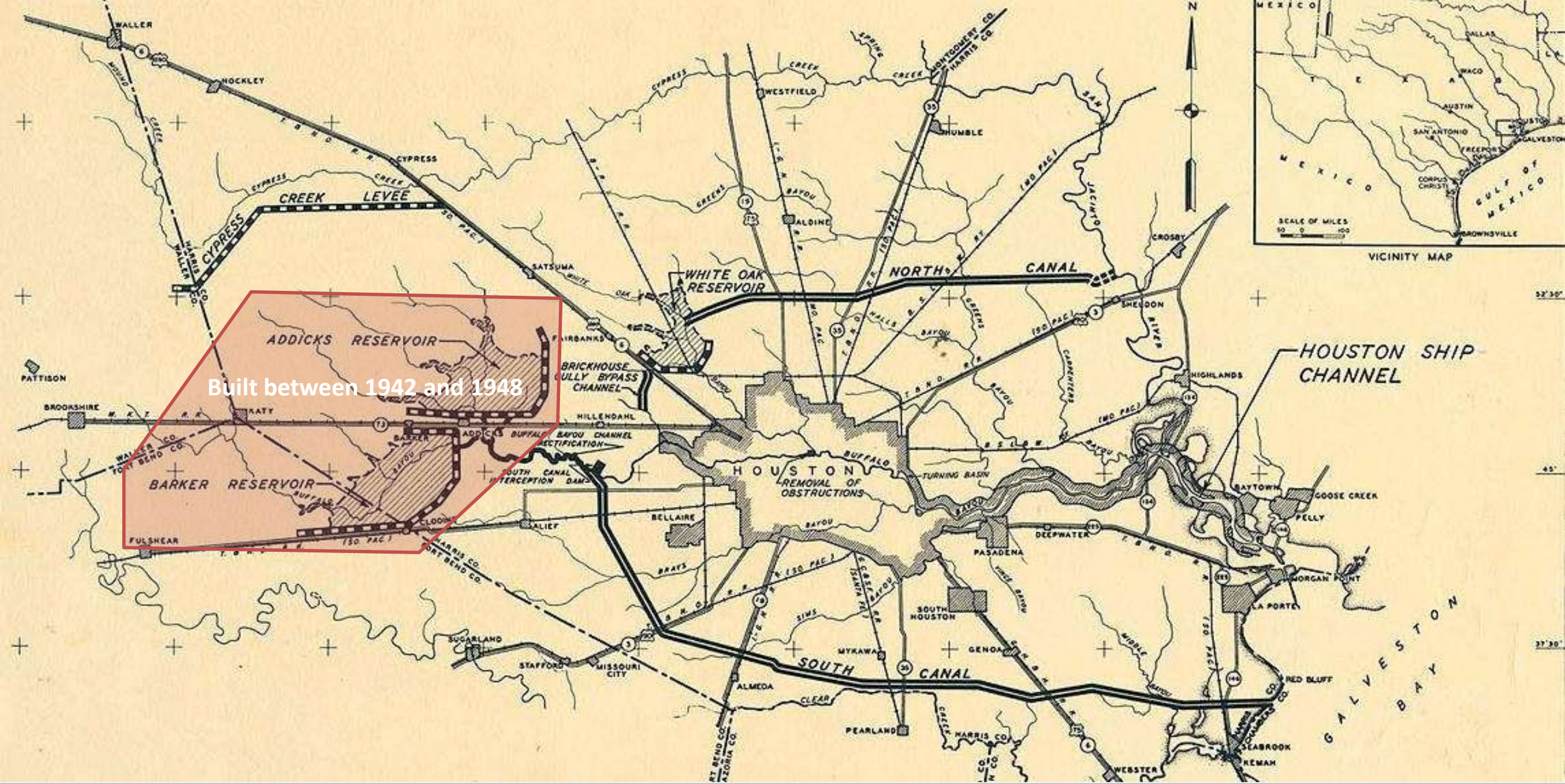

USACE Houston Flood Control Plan ~ 1940

Why Now?

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Why Not? Disproving the Myths

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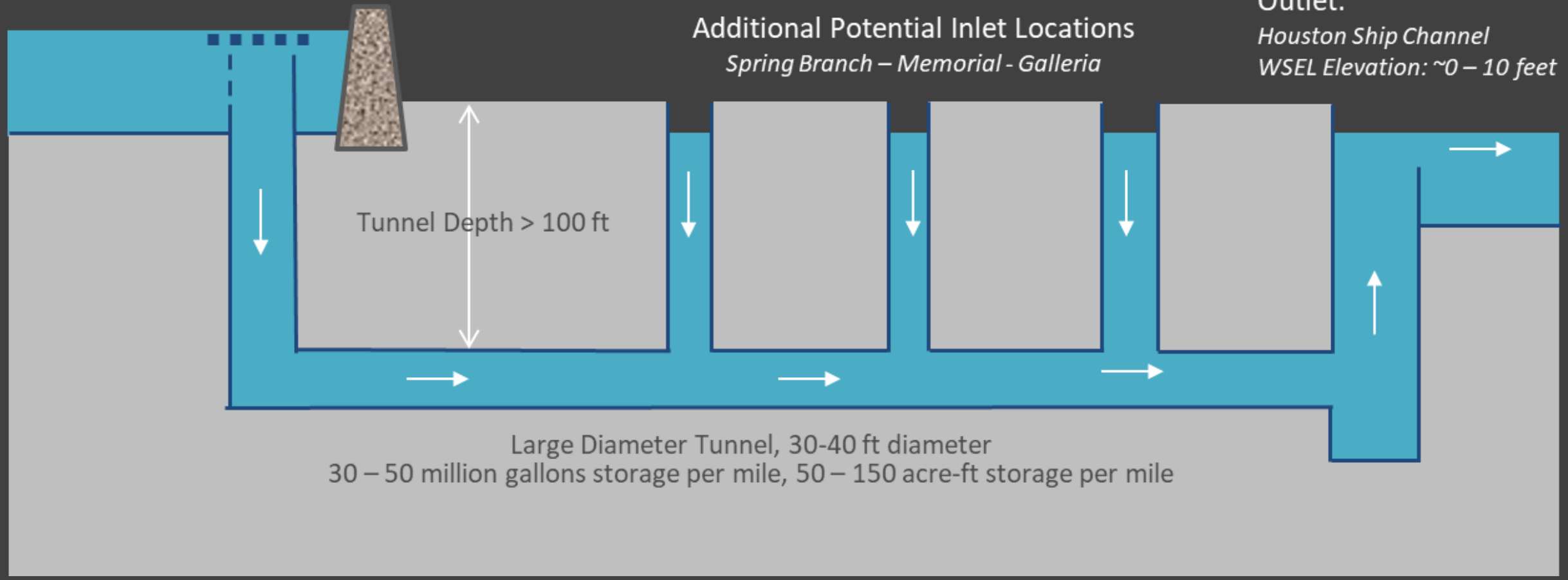
Reliable Gravity Flow

Inlet:
Barker Reservoir
Elevation: 95.5 feet (1% Pool) Max 104 feet

Additional Potential Inlet Locations
Spring Branch – Memorial - Galleria

Outlet:
Houston Ship Channel
WSEL Elevation: ~0 – 10 feet



How it Works

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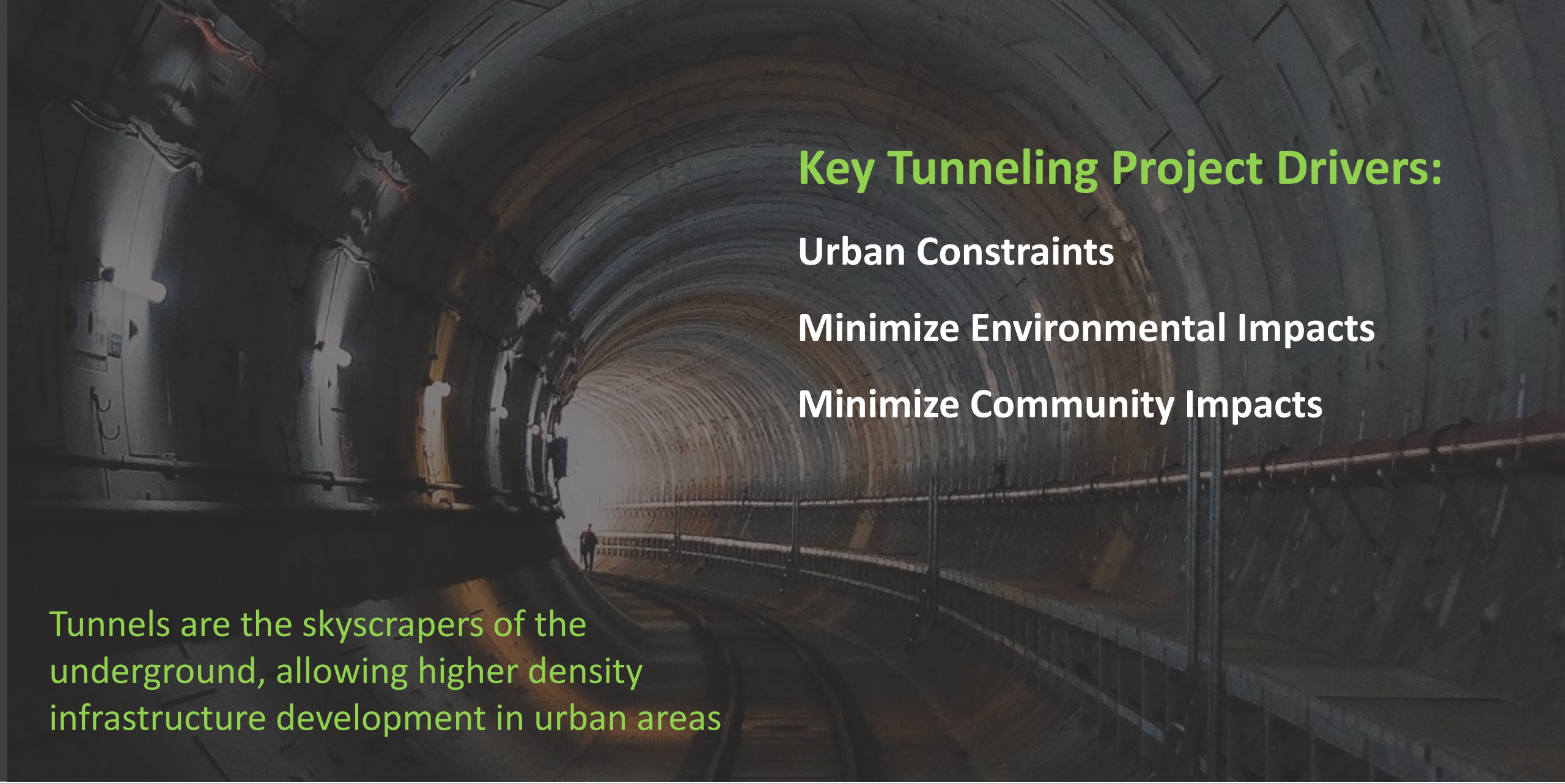

Key Tunneling Project Drivers:

Urban Constraints

Minimize Environmental Impacts

Minimize Community Impacts

Tunnels are the skyscrapers of the underground, allowing higher density infrastructure development in urban areas

Tunneling: The Future is Now

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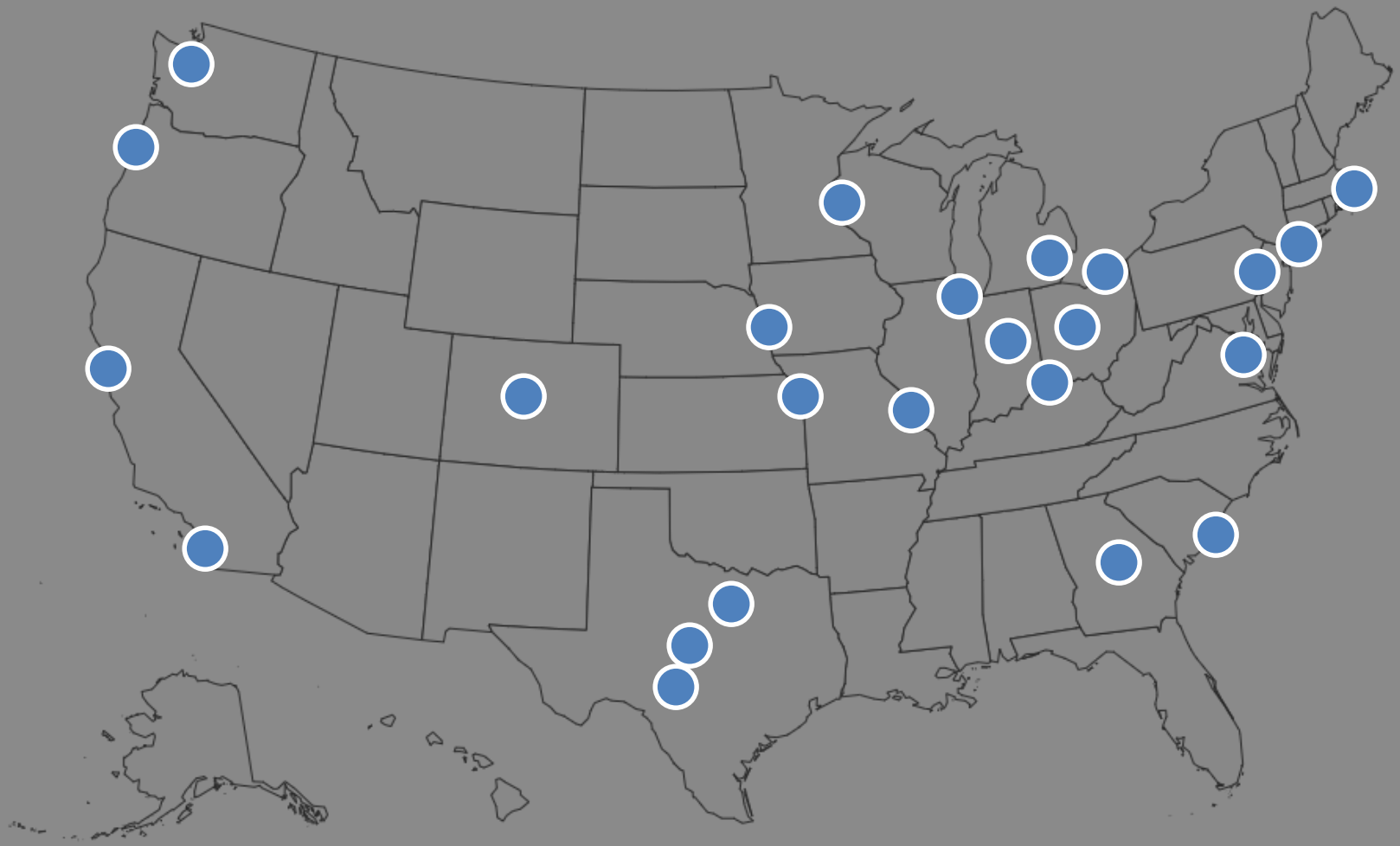

Tunneling is a Proven Solution

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Concept in Action

San Antonio River Tunnel

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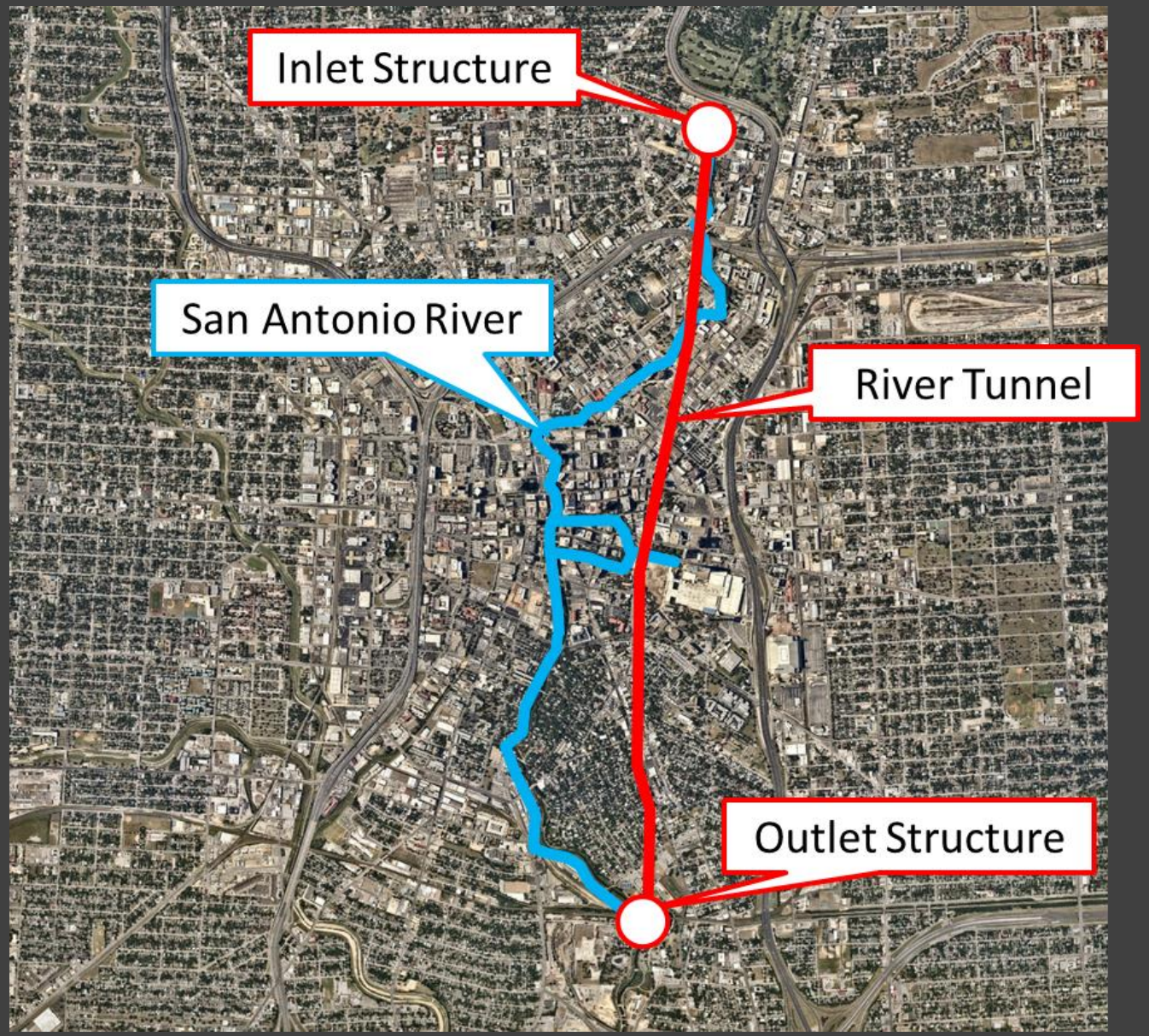

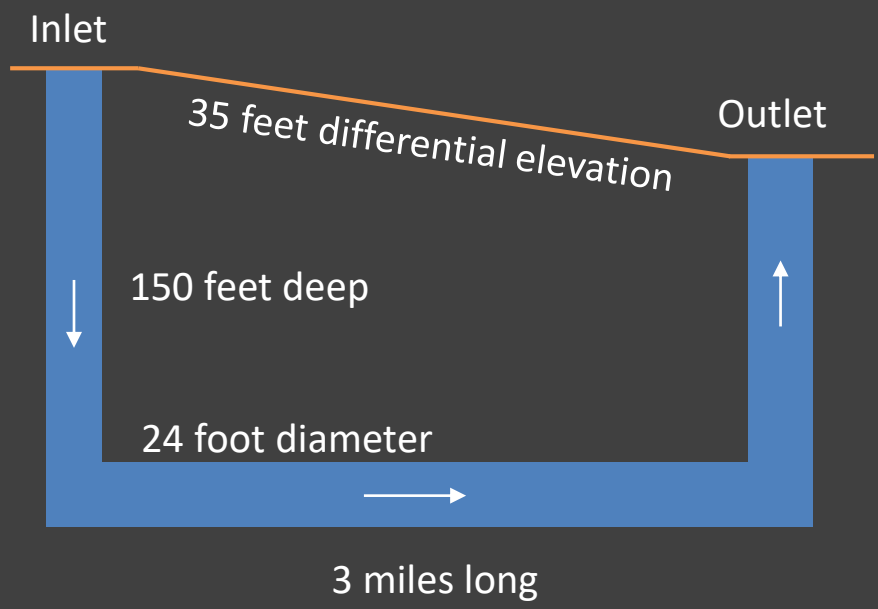

- Built by SARA and USACE in 1997
- 6,700 cfs flow rate

San Antonio River Tunnel

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San Antonio River Tunnel - Inlet

FREESE AND NICHOLS

San Antonio River Tunnel - Outlet

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How is it built?

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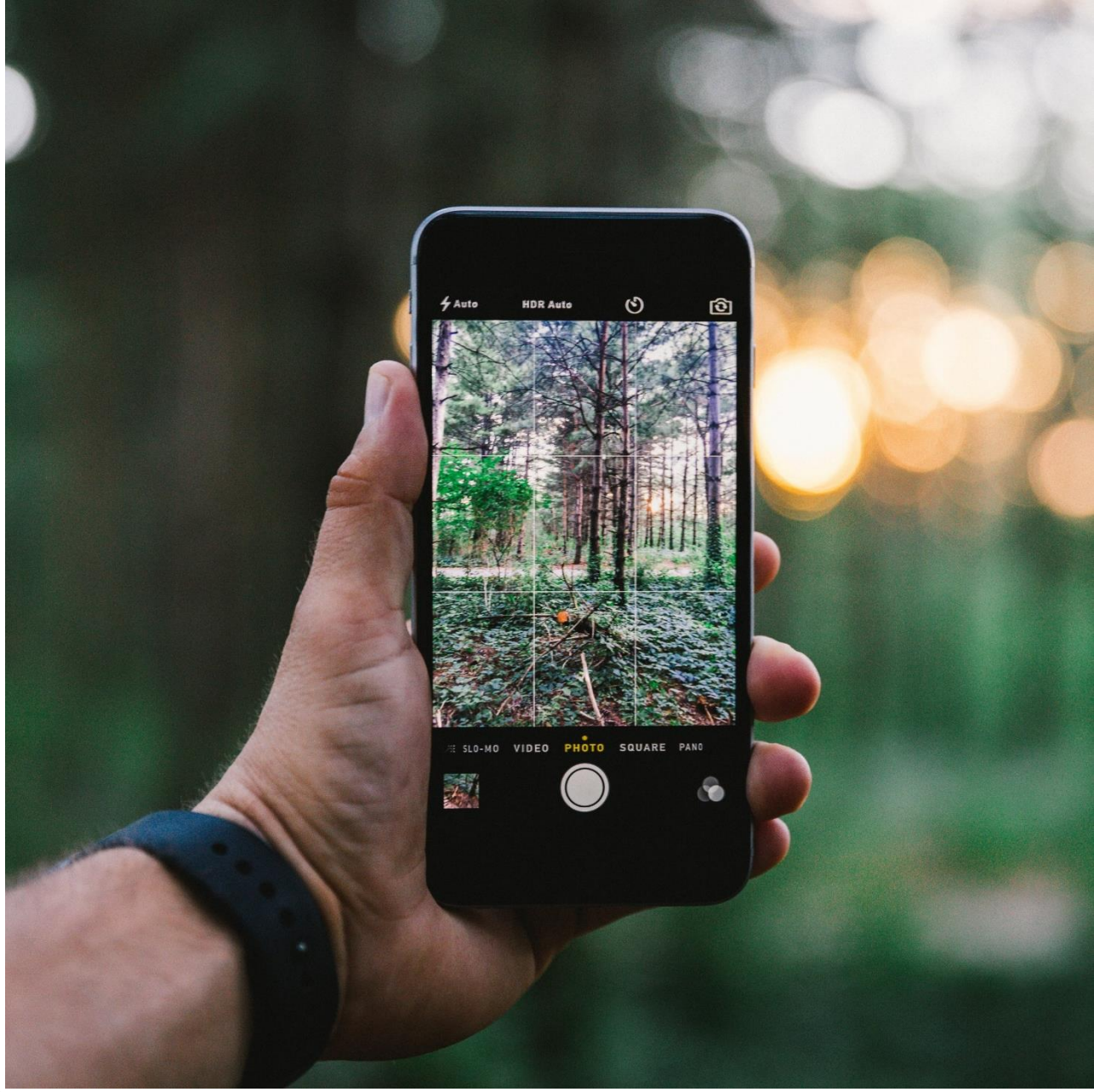

Major Technological Advances

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1985
HERA
20 ft

1996
Sydney
35 ft

1997
Hamburg
46 ft

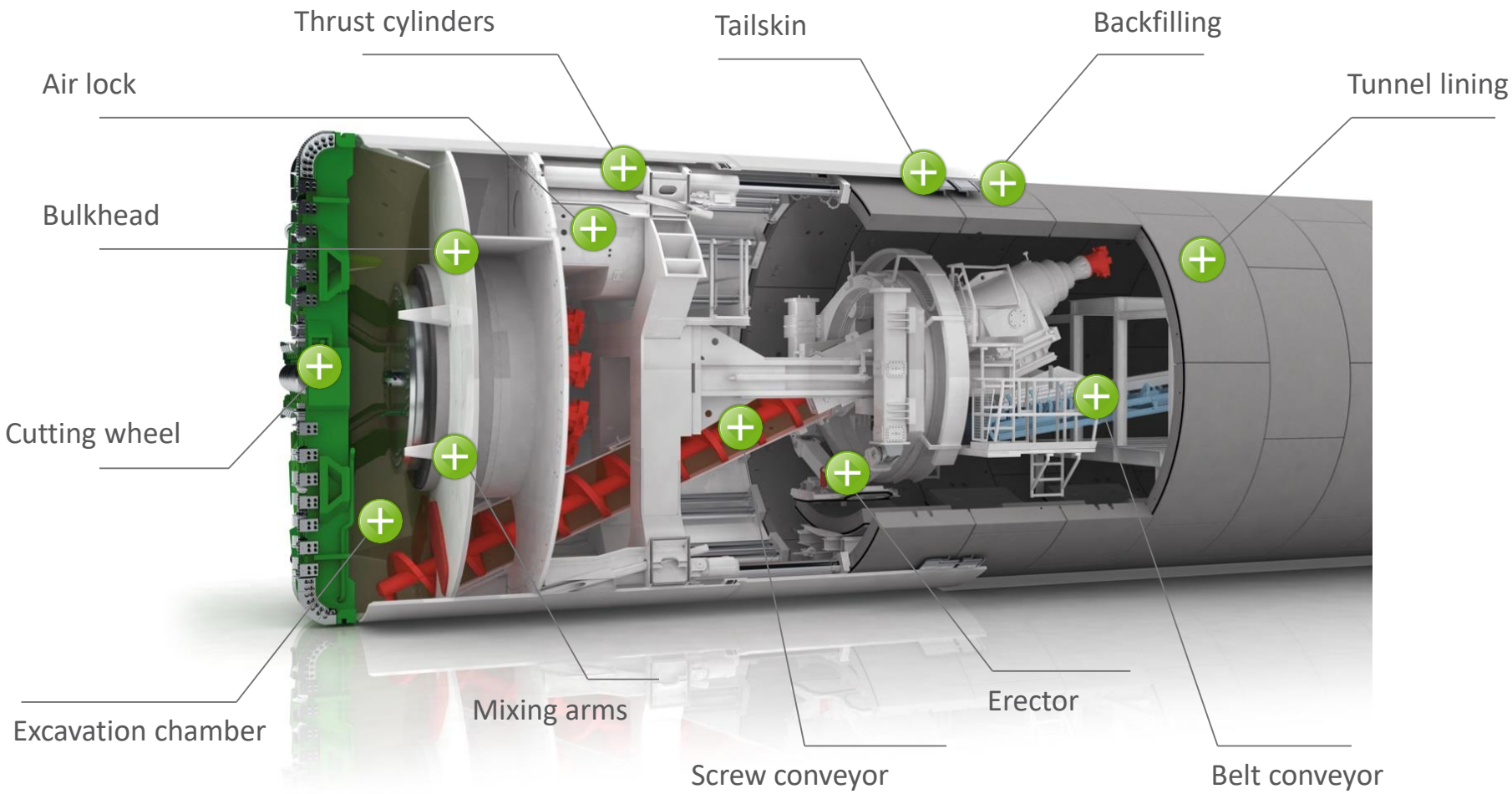
2006
Shanghai
50 ft

2013
Hong Kong
57 ft

Significant Technological Advances

HERRENKNECHT
Tunnelling Systems

State-of-the-Art Excavation Methods



Earth Pressure Balance TBM

HERRENKNECHT
Tunnelling Systems

Typical Tunnel Shaft

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dallas

Mill Creek Tunnel
5 miles long
35 foot diameter
$206 million

san antonio

San Antonio River Tunnel
3 miles long
24 foot diameter
$230 million (2018$)

San Pedro Creek Tunnel
1 mile long
24 foot diameter
$110 million (2018$)

austin

Waller Creek Tunnel
1.1 miles long
20-26 foot diameter
$163 million

What do similar projects cost?

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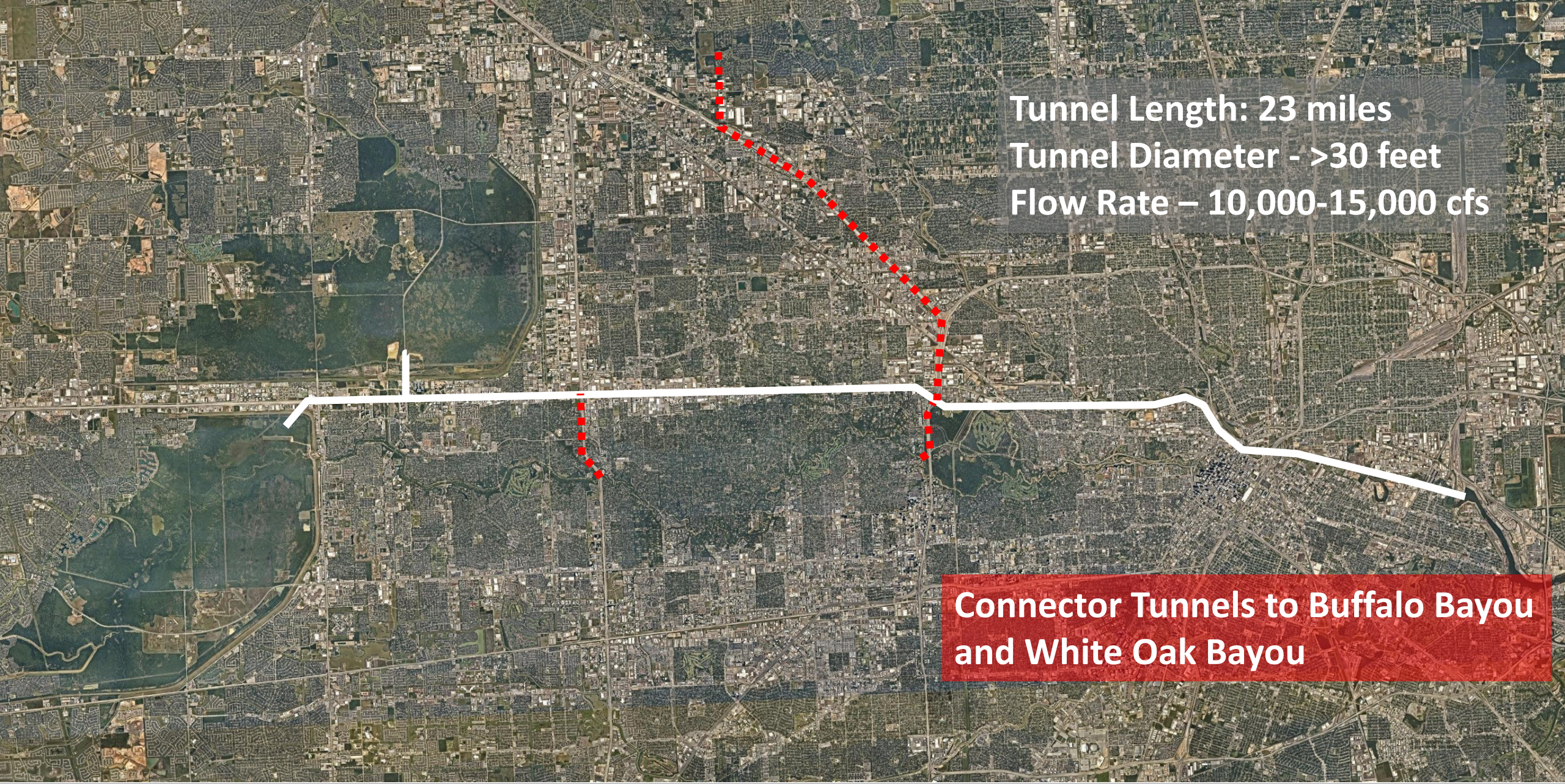

The Super Tunnel Alternative

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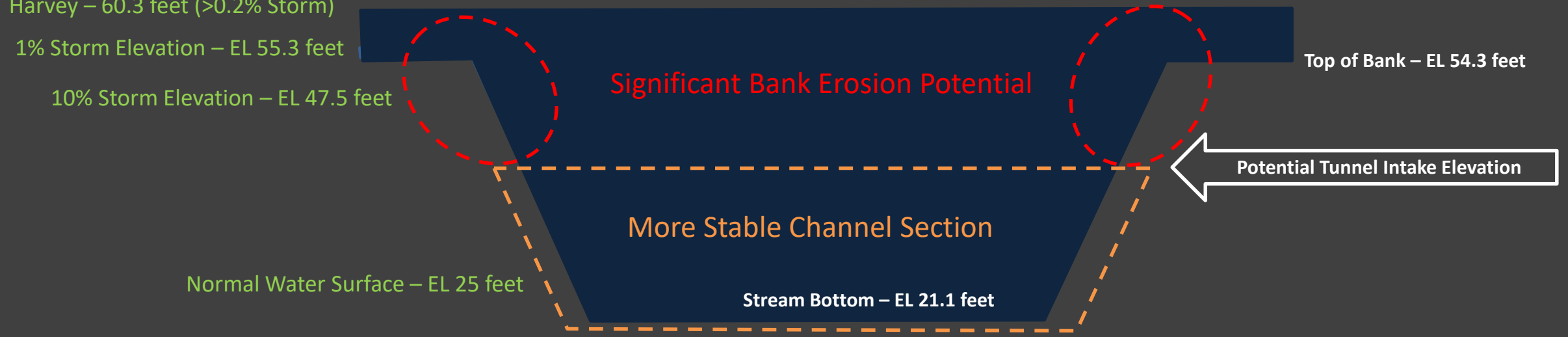
Buffalo Bayou Channel Section at San Felipe Drive near Voss Road



Reduce Bank Erosion & Sedimentation

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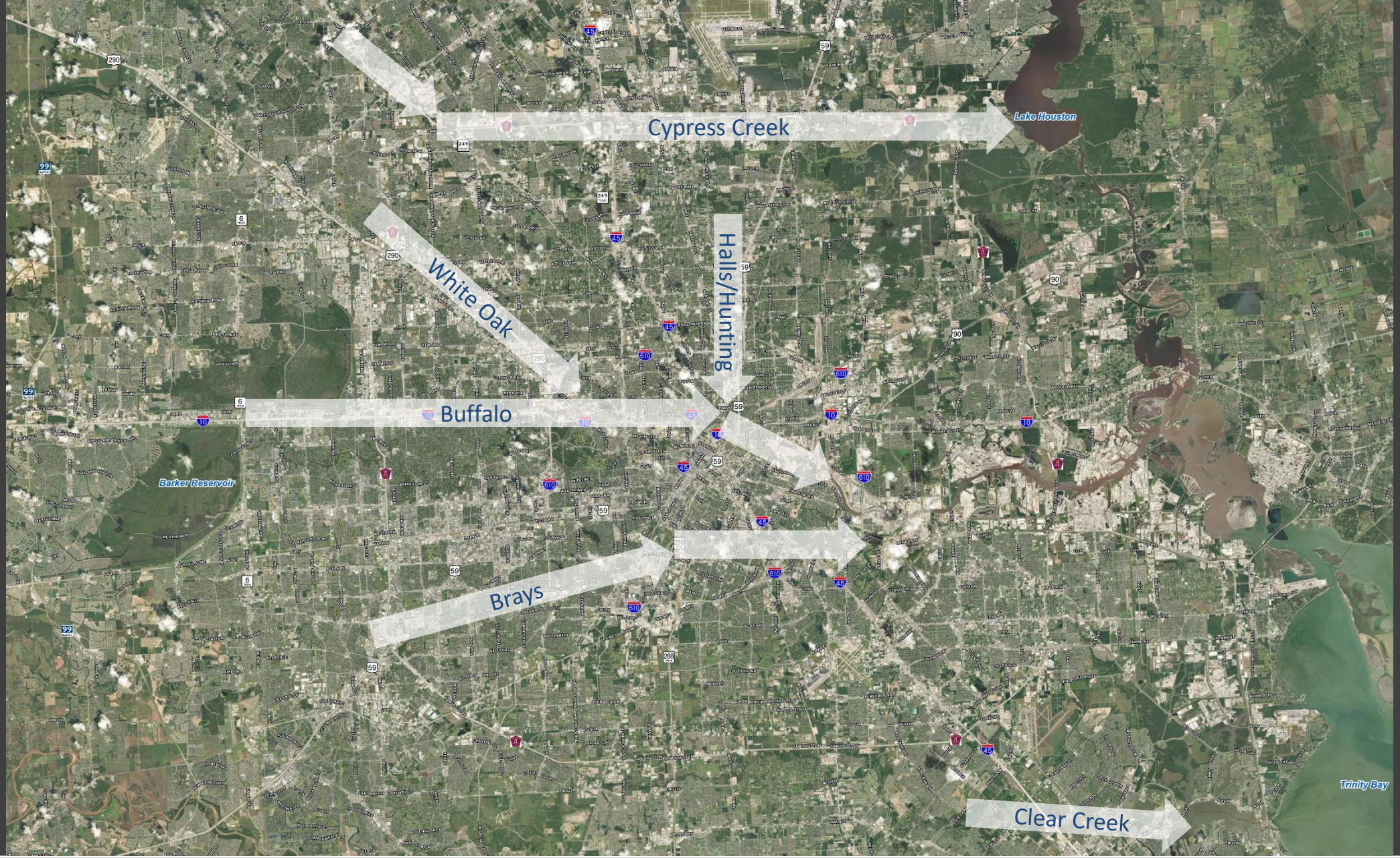

Metro Wide Benefits

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There is light at the end of the tunnel

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Flood Tunnel

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